

REMARKS

Claims 8 and 9 have been canceled. Claims 1, 11, and 19 have been amended. Claims 1 through 7 and 10 through 20 remain in the application.

Claims 1 through 20 were rejected under 35 U.S.C. § 103 as being unpatentable over Wynn (U.S. Patent No. 4,129,145) in view of Hoover (U.S. Patent No. 4,964,391) and further in view of Feinberg (U.S. Patent No. 3,234,959). Applicant respectfully traverses this rejection.

U.S. Patent No. 4,129,145 to Wynn discloses a check valve assembly. valve seat 14 is located on the interior surface of valve body 10. A valve seat 14 has a seating surface 16 facing toward a downstream end 12 of a valve body 10. The seating surface 16 is preferably inclined with respect to a centerline of the valve body 10. A shoulder 18 is located on the upstream side of the valve seat 14 and defines a recess 20. A poppet element 22 is adapted to be inserted within the valve body 10 through an upstream end 11 thereof. The poppet element 22 has a circumferential surface 24 at its downstream end. The circumferential surface 24 has a narrow neck 26, and the portion 28 of the circumferential surface 24 downstream of the neck 26 has a frustoconical configuration. Wynn does not disclose a valve member having an end adjacent the valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end, a seal disposed in the groove for contacting the valve seat and, a single outlet port to allow flow from the valve member when the valve member is in the open position.

U.S. Patent No. 4,964,391 to Hoover discloses a check valve for engine fuel delivery systems. A fuel delivery system 20 includes a fuel pump 22 for delivering fuel under pressure from a supply or tank 24 to a fuel consumer 26, such as an internal combustion engine.

A check valve 28 is connected in a fuel line between the fuel pump 22 and the engine for permitting free flow of fuel from the pump to the engine, but preventing back-flow of fuel from the engine to the pump when the pump is shut off. Hoover does not disclose a valve member having an end adjacent the valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end, a seal disposed in the groove for contacting the valve seat and, a single outlet port to allow flow from the valve member when the valve member is in the open position.

U.S. Patent No. 3,234,959 to Feinberg discloses a checking valve device. A valve has a casing 10 and a pair of tubular coupling members 14,15 screwed into access openings 12,13 of the casing 10. A pair of tubular sleeve members 28,29 is positioned within the casing 10 before the coupling members 14,15 are screwed in place. A pair of fluid discharge orifices 35,36 is formed in the side walls of the sleeve members 28,29 upwardly from the closed ends of those members to provide separate fluid passages through the valve. Feinberg does not disclose a valve housing adapted to be disposed in an outlet member of a fuel pump, a valve seat formed on an interior surface of the valve housing, and a valve member disposed in the valve housing and having an end adjacent the valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end, a seal disposed in the groove for contacting the valve seat.

In contradistinction, claim 1, as amended, clarifies the invention claimed as a check valve for a fuel pump including a valve housing adapted to be disposed in an outlet member of the fuel pump and a valve seat formed on an interior surface of the valve housing. The check valve also includes a valve member disposed in the valve housing and having a closed position to operatively engage the valve seat to prevent fuel from flowing through the outlet

member and an open position to allow fuel to flow through the outlet member. The valve member has an end adjacent the valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end, a seal disposed in the groove for contacting the valve seat and, a single outlet port to allow flow from the valve member when the valve member is in the open position. Claim 11 has been amended similar to claim 1 and includes other features of the present invention.

The United States Court of Appeals for the Federal Circuit (CAFC) has stated in determining the propriety of a rejection under 35 U.S.C. § 103, it is well settled that the obviousness of an invention cannot be established by combining the teachings of the prior art absent some teaching, suggestion or incentive supporting the combination. See In re Fine, 837 F.2d 1071, 5 U.S.P.Q.2d 1596 (Fed. Cir. 1988); Ashland Oil, Inc. v. Delta Resins & Refractories, Inc., 776 F.2d 281, 227 U.S.P.Q. 657 (Fed. Cir. 1985); ACS Hospital Systems, Inc. v. Montefiore Hospital, 732 F.2d 1572, 221 U.S.P.Q. 929 (Fed. Cir. 1984). The law followed by our court of review and the Board of Patent Appeals and Interferences is that “[a] prima facie case of obviousness is established when the teachings from the prior art itself would appear to have suggested the claimed subject matter to a person of ordinary skill in the art.” In re Rinehart, 531 F.2d 1048, 1051, 189 U.S.P.Q. 143, 147 (C.C.P.A. 1976). See also In re Lalu, 747 F.2d 703, 705, 223 U.S.P.Q. 1257, 1258 (Fed. Cir. 1984) (“In determining whether a case of prima facie obviousness exists, it is necessary to ascertain whether the prior art teachings would appear to be sufficient to one of ordinary skill in the art to suggest making the claimed substitution or other modification.”)

None of the references cited, either alone or in combination, teaches or suggests the claimed invention of claims 1 and 11. Specifically, Wynn ‘145 merely discloses a check

valve assembly having a valve seat located on an interior surface of a valve body. Wynn '145 lacks a valve member having an end adjacent a valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end, a seal disposed in the groove for contacting the valve seat, and a single outlet port to allow flow from the valve member when the valve member is in the open position. Hoover '391 merely discloses a check valve for engine fuel delivery systems in which a check valve is connected in a fuel line between a fuel pump and an engine. Hoover '391 lacks a valve member having an end adjacent a valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end, a seal disposed in the groove for contacting the valve seat, and a single outlet port to allow flow from the valve member when the valve member is in the open position. Feinberg '959 merely discloses a valve checking device having a casing, a pair of tubular coupling members, a pair of tubular sleeve members positioned within the casing before the coupling members are screwed in place, and a pair of fluid discharge orifices formed in the side walls of the sleeve members. Feinberg '959 lacks a valve member having an end adjacent a valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end, a seal disposed in the groove for contacting the valve seat, and a single outlet port to allow flow from the valve member when the valve member is in the open position. There is no suggestion or motivation in the art for combining Wynn '145, Hoover '391, and Feinberg '959 together.

The references, if combinable, fail to teach or suggest the combination of a check valve for a fuel pump including a valve housing adapted to be disposed in an outlet member of the fuel pump, a valve seat formed on an interior surface of the valve housing, a valve member disposed in the valve housing and having a closed position to operatively engage the valve seat to

prevent fuel from flowing through the outlet member and an open position to allow fuel to flow through the outlet member in which the valve member has an end adjacent a valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end, a seal disposed in the groove for contacting the valve seat, and a single outlet port to allow flow from the valve member when the valve member is in the open position as claimed by Applicants.

The claimed combination is novel and unobvious because the check valve has a mono-port on the pintel, which reduces oscillations and objectionable noise. The Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claims 1 and 11 and the claims dependent therefrom are allowable over the rejection under 35 U.S.C. § 103.

As to claim 19, claim 19, as amended, clarifies the invention claimed as a fuel pump including an outlet member having a passageway therethrough, a valve housing disposed in the passageway of the outlet member, and a valve seat formed on an interior surface of the valve housing. The fuel pump also includes a valve member disposed in the valve housing and having an end adjacent the valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end and including a seal disposed in the groove. The fuel pump includes a spring disposed about the valve member to urge the valve member toward the valve seat in a closed position in which the seal engages the valve seat to prevent fuel from flowing through the outlet member. The valve member has a single outlet port to allow flow from the outlet port when the valve member is in an open position to allow fuel to flow through the outlet member.

None of the references cited, either alone or in combination, teaches or suggests the claimed invention of claim 19. Specifically, Wynn '145 merely discloses a check valve

assembly having a valve seat located on an interior surface of a valve body. Wynn '145 lacks a fuel pump having an outlet member having a passageway therethrough, a valve housing disposed in the passageway of the outlet member, and a valve member having an end adjacent the valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end and a single outlet port to allow flow from the valve member when the valve member is in the open position. Hoover '391 merely discloses a check valve for engine fuel delivery systems in which a check valve is connected in a fuel line between a fuel pump and an engine. Hoover '391 lacks a fuel pump having an outlet member having a passageway therethrough, a valve housing disposed in the passageway of the outlet member, and a valve member having an end adjacent the valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end, and a single outlet port to allow flow from the valve member when the valve member is in the open position. Feinberg '959 merely discloses a valve checking device having a casing, a pair of tubular coupling members, a pair of tubular sleeve members positioned within the casing before the coupling members are screwed in place, and a pair of fluid discharge orifices formed in the side walls of the sleeve members. Feinberg '959 lacks a fuel pump having an outlet member having a passageway therethrough, a valve housing disposed in the passageway of the outlet member, a valve seat formed on an interior surface of the valve housing, and a valve member disposed in the valve housing and having an end adjacent the valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end and including a seal disposed in the groove and having a closed position in which the seal engages the valve seat. There is no suggestion or motivation in the art for combining Wynn '145, Hoover '391, and Feinberg '959 together.

The references, if combinable, fail to teach or suggest the combination of a fuel pump including an outlet member having a passageway therethrough, a valve housing disposed in the passageway of the outlet member, a valve seat formed on an interior surface of the valve housing, a valve member disposed in the valve housing and having an end adjacent the valve seat with an annular groove having a generally circular cross-sectional shape extending radially into the end and including a seal disposed in the groove, a spring disposed about the valve member to urge the valve member toward the valve seat in a closed position in which the seal engages the valve seat to prevent fuel from flowing through the outlet member in which the valve member has a single outlet port to allow flow from the outlet port when the valve member is in an open position to allow fuel to flow through the outlet member as claimed by Applicants.

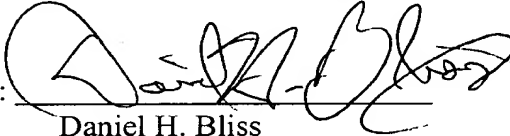
Further, the CAFC has held that “[t]he mere fact that prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification”. In re Gordon, 733 F.2d 900, 902, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984). The Examiner has failed to show how the prior art suggested the desirability of modification to achieve Applicant’s invention. Thus, the Examiner has failed to establish a case of prima facie obviousness. Therefore, it is respectfully submitted that claim 19 and the claims dependent therefrom are allowable over the rejection under 35 U.S.C. § 103.

Obviousness under § 103 is a legal conclusion based on factual evidence (In re Fine, 837 F.2d 1071, 1073, 5 U.S.P.Q.2d 1596, 1598 (Fed. Cir. 1988), and the subjective opinion of the Examiner as to what is or is not obvious, without evidence in support thereof, does not suffice. Since the Examiner has not provided a sufficient factual basis, which is supportive of his/her position (see In re Warner, 379 F.2d 1011, 1017, 154 U.S.P.Q. 173, 178 (C.C.P.A. 1967), cert. denied, 389 U.S. 1057 (1968)), the rejection of claims 1 through 20 is improper. Therefore,

it is respectfully submitted that claims 1 through 7 and 10 through 20 are allowable over the rejections under 35 U.S.C. § 103.

Based on the above, it is respectfully submitted that the claims are in a condition for allowance or in better form for appeal. Applicants respectfully request reconsideration of the claims and withdrawal of the final rejection. It is respectfully requested that this Amendment be entered under 37 C.F.R. 1.116.

Respectfully submitted,

By: 
Daniel H. Bliss
Reg. No. 32,398

Delphi Technologies, Inc.
Legal Staff – Intellectual Property
P.O. Box 5052
Troy, Michigan 48007
(248) 813-1214

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